



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,937	06/26/2003	Ichirou Miyagawa	Q76019	3417
23373	7590	12/15/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			PHAM, HAI CHI	
			ART UNIT	PAPER NUMBER
			2861	

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/603,937

Applicant(s)

MIYAGAWA, ICHIROU

Examiner

Hai C Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/26/03 & 12/23/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.
3. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3:

- The following limitation "ejecting the one incident light beam so that an optical axis of the ejected light beams is parallel to an optical axis of the light beam" (emphasis added) appears to be ambiguous in that it is not clear which light beam is being referred to. Moreover, since the ejected light beams are directed to different positions or directions, one of the ejected light beam may have an optical axis parallel to the optical axis of the incident light beam (assuming that the referred light beam is the incident light beam) and it is unclear which of the two ejected light beams is parallel to the incident light beam.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-8, 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ichiro (JP 2000-284206).

Ichiro, an acknowledged prior art, discloses an exposure recording device comprising an array refracting element, which includes a refracting member (64, Fig. 13) having a unit surface shape for dividing one light beam (L) into two light beams (L1 and L2) by ejecting the one incident light beam toward different positions (on the recording film F), wherein the array refracting element is configured to arrange the two refracting members in pair unit in an array shape in a direction orthogonal to a light beam dividing direction (the prism 64 having a pair of exit surfaces 66a and 66b slanted in the auxiliary scanning direction indicated by the arrow Y). Ichiro further teaches the exposure recording device having an multiple exposure head (82, Fig. 15) comprising a plurality of exposure units (84a-84g), each of which is identical as in structure to the single exposure unit (12), and thus would include an array of prisms (64) as pair units.

With regard to claims 2-8 and 11-13, Ichiro further teaches:

- the unit surface shape is a shape for dividing the one incident light beam into different angular orientations and ejecting the divided light beams (the exit

surfaces 66a and 66b being slanted in the sub-scanning direction such that the ejected divided light beams L1 and L2 have different angular orientations) (Figs. 12 and 13),

- the unit surface shape of the array refracting element is a shape for dividing and ejecting the one incident light beam so that an optical axis of the ejected light beams is parallel to an optical axis of the light beam (the optical axes of the ejected light beams L1 and L2 are parallel to that of the incident light beam L) (Fig. 13),
- the array refracting element is configured using optical glass (glass prism),
- the two refracting members are a first refracting member having a rectangular shape in plan view (the upper part of the prism 64 having an entrance surface of rectangular shape in plan view), and a second refracting member having, at [one of a light beam incident side or] a light beam ejecting side, a rectilinear sloped surface from one end to another end in the direction of the division of the light beam (the exit surface 66a of the lower part of the prism 64 having a rectilinear sloped surface in the direction of the division of the light beam, e.g., auxiliary scanning direction),
- the two refracting members are a first refracting member having, at [one of a light beam incident side or] a light beam ejecting side, a rectilinear sloped surface from one end to another end in the direction of the division of the light beam (the exit surface 66b of the upper part of the prism 64 having a rectilinear sloped surface in the direction of the division of the light beam, e.g., auxiliary scanning

direction), and a second refracting member having, at [one of the light beam incident side or] the light beam ejecting side, a rectilinear sloped surface from the other end to the one end in the direction of the division of the light beam (the exit surface 66a of the lower part of the prism 64 having a rectilinear sloped surface in the direction of the division of the light beam, e.g., auxiliary scanning direction),

- the two refracting members are a first refracting member having at one of a light beam incident side or a light beam ejecting side, at least two rectilinear sloped surfaces from one end to another end in the direction of the division of the light beam, and a second refracting member having, at one of the light beam incident side or the light beam ejecting side, at least two rectilinear sloped surfaces from the other end to the one end in the direction of the division of the light beam (the pair units prism 64 in the configuration of the multiple exposure head 82 would include a series of upper slanted surfaces and lower slanted surfaces in the auxiliary scanning direction),
- the two refracting members are a first refracting member having, at one of a light beam incident side or a light beam ejecting side, at least two rectilinear sloped surfaces from one end to another end in the direction of the division of the light beam, and a second refracting member having a rectangular shape in plan view (in the case of multiple exposure head 82, a series of upper portions of the prism having the exit surfaces being slanted and a series of the lower portions with entrance surfaces having rectangular shape in plan view),

Art Unit: 2861

- a light source (LD, Fig. 1) for ejecting a light beam emitted in a broad area for at least a main-scanning direction, a condensing optical system (42) for condensing the light beam emitted from the light source on the recording medium (F),
- the array refracting element (prism 64) is disposed at a position at which a far field pattern of the light beam emitted from the light source is formed (the prism 64 being disposed closed to the recording medium F) (Fig. 12),
- an inputting component for inputting resolution information showing resolution of an image formed on the recording medium by the scanning exposure (the resolution data being inputted into the control circuit 49) (Fig. 4), and a moving component in which the array refracting element is removed from the optical axis of the light beam emitted from the light source when the resolution shown by the resolution information is a predetermined first resolution (resolution $S = 2.K0$ dpi), and the array refracting element is moved so as to be placed on the optical axis when the resolution shown by the resolution information is a second resolution (resolution $S = K0$ dpi), which is lower than the first resolution (the prism being moved in and out of the path of the optical axis of the light beam for changing the resolution) (Fig. 12).

6. Claims 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishi et al. (U.S. 5,815,249).

Nishi et al. discloses an array diffracting element comprising an optically transparent [thus refractive] substrate (6) with diffraction grating G formed on the exit

Art Unit: 2861

surface of the substrate 6 with projection Ga and recesses Gb such that the incident light beam IL1 is divided into a zeroth order diffracting light beam IL(0) and first order diffracting beams IL(+1) and IL(-1) in different directions, wherein n diffraction light beams can be selected (n being an integer not less than 2), the array diffracting element having exit surface shape formed with projection Ga and recesses Gb to form pair units arranged in a [horizontal] direction orthogonal to the light beam dividing [vertical] direction as shown in Fig. 2 (col. 9, lines 4-38).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyagawa in view of Nishi et al.

Miyagawa discloses all the basic limitations of the claimed invention except for the array refracting element being an array diffracting element.

Nishi et al. discloses an array diffracting element for dividing an incident light beam into plural light beams (see paragraph 6 above), the implement of which would enhance the resolution or the depth of focus of the light beams.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide an array diffracting element in the device of

Art Unit: 2861

Miyagawa as taught by Nishi et al. The motivation for doing so would have been to further improve the resolution and/or the depth of focus as suggested by Nishi et al.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (571) 272-1934. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM
PRIMARY EXAMINER

December 9, 2004